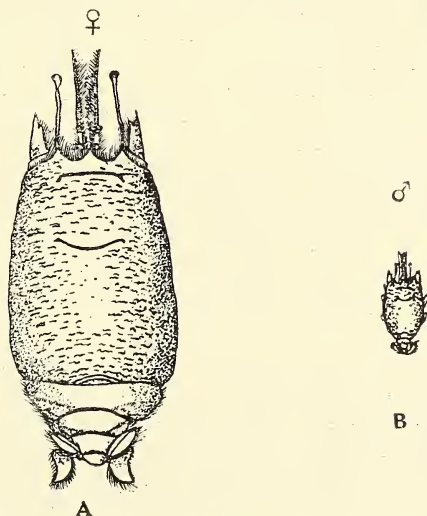


out an acrid smell and when many are being pounded up the 'fumes' which arise make the eyes smart. Aitken suggests that the sensation produced when eating them 'must be like a torch light procession going down the throat'. Apart from food value it is good to know that the acrid aroma of pulverised red ant is a substitute for *smelling salts*.¹ Tamil coolies in Ceylon use it (A. L. Butler, vol. x, p. 330). The *modus operandi* is to go to a teeming nest in a bush, seize it with both hands and rub ants and nest together violently between the palms, then take a few good penetrating sniffs of the ammonia-like fumes which arise from the crushed and bruised insects. This, we are told, will instantly relieve a severe cold in the head. The termites which form the subject of the above note are no connections of ants. As a family they are considered relatives of the Cockroaches. Cockroaches as an article of food also provide a long and interesting subject. Space does not permit us to discuss it here.—Eds.]

XXIII.—A NOTE ON THE MALES OF *EMERITA* (*HIPPA*) *ASIATICA*.

No reference to the males of this species occurs in the works of any of the Carcinologists¹ who have dealt with it. The only explanation is that they either failed to notice it, or, which is more probable, their great disparity in size would have caused them to be mistaken for young ones.



A. Female of *Emerita* (*Hippa*) *asiatica*.

B. Male.

The carapace of the adult females varies from 22 to 30 mm. in length with an average of 25 mm., while the largest male I have been able to secure at this place has a carapace length of only

¹ Milne Edwards, 1837; Heller, 1868; Miers, 1879; Henderson, 1893; Nobili, 1903.

7.5 mm. The corresponding lengths for the two American species *E. emerita* and *E. analoga* are respectively 20 to 22 mm. (female), 14 mm. (male) and 22.4 mm. (female), 12 to 14 mm. (male). It is thus seen that though the adult females of the Asiatic species are decidedly larger than their American confreres, the males are only about half of those of the latter. There is, however, no positive evidence to show that they do not grow beyond this size; but the failure to secure larger ones, though collections were continued for more than two months amounting to a couple of hundred specimens, seems to show that such is the case.

A very interesting point about their habits that has been observed seems worth mentioning here. In the months of March and April the narrow zone of the low water mark was teeming with the young ones of this animal, so that one can collect several by simply scooping up a handful of sand. A collection made at this time shows a good number of males, which can be easily recognised by the presence of the genital papillae on the coxopodites of the last pair of thoracic legs. They varied from 4 to 6 mm. in the length of their carapace. No attempt was made to collect them in the next two months. In July, however, they had grown considerably and all of the large ones were females. This inexplicable absence of large sized males led to a more careful search and it was then discovered that adult females which had recently moulted and were therefore softbodied had each two or three, and sometimes more, young individuals on the ventral side between the posterior part of the thorax and the abdomen; the latter being normally pressed against the underside of the thorax. They do not seem to be attached to any part of the female; but are probably prevented by the thorax from being displaced.

On examination all of them were found to be males. In one or two cases a stray female was also noticed, but that seems to be only exceptional. The females carrying them had a mass of spermatophores in the groove between the sixth and seventh pair of thoracic legs. In *Emerita* also therefore, as in several other crabs, the union of sexes takes place soon after moulting. The spermatophores are simply deposited on the ventral surface of the female, the coxal papillae of the last legs probably aiding in the process.

The smallest of these males measured only 3.5 mm., that is only slightly bigger than the first post larval stage and possessed vestiges of the abdominal limbs which completely disappear later. The reproductive system on the other hand was well developed and often contained fully developed sperms. Most of the males secured from females varied between 3.5 and 6 mm. in length, larger ones being only found very rarely in association. In some of these specimens a part of the long string of spermatophores was actually seen protruding through the genital opening. There is therefore no doubt that these are fully mature individuals.

Though the habits of the two American species have been studied by several authors, nothing so far as I am aware, has been recorded about such an early association of sexes as obtains in the case of the present form.

The very early development and maturation of the sexual organs in young ones which have probably undergone only a single moult after the first post larval stage (as indicated by the size) is also a very interesting phenomenon in the Decapoda. It appears that sex differentiation takes place at a very early stage in the life of this form and the males, whenever possible, come into association with the females soon after leaving their free swimming existence.

In a few instances one or two of the smallest individuals were in the process of ecdysis which might indicate that in their case at any rate the association is not quite temporary.

In the allied form *Albunea*, one species of which, *A. symnista*, exists side by side with *Emerita* at Madras, adult males attain to about two-third of the size of females and are easily got at certain times of the year. It would seem therefore that the case of the latter is an instance of premature sexual maturity. Secondary sexual characters like greater size, differently shaped chelipeds, narrow abdomens and so on are frequent in male Decapods. Dimorphism of males, the two forms in some cases being 'alternating breeding and non-breeding phases in the life-history of the same individual' has also been noticed among some Crayfishes and crabs belonging to the subtribe *Oxyrhyncha*. But instances parallel to that of *Emerita* do not seem to be of common occurrence. The fate of these males, after the transference of the reproductive elements should therefore be of great interest and it is hoped that a systematic search to be made hereafter would yield definite information bearing on it.

MADRAS.

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XXIV.—OCCURRENCE OF *ISOËTES COROMANDELINA* L. IN THE BOMBAY PRESIDENCY.

In vol. xxxv, p. 471, I recorded the occurrence of a species of *Isoëtes* in the Presidency. I submitted the material for examination and report to Dr. H. Reimers of the Botanischen Garten und Botanischen Museum, Dahlem (Berlin). He writes: "There is only one species in East India, namely *Isoëtes coromandelina* L. Your plant is a large form of this species and agrees very well with *I. brachyglossa* Braun described in 1862 from the Nilgiris (Wight No. 309) but now considered as a mere form of *I. coromandelina*. The species is also represented in our herbarium from Madras and Terampur¹ (near Calcutta ?). In N. E. Pferffer's monograph of the Isoëtaceae (Annals of the Missouri Bot. Garden, vol. ix, 1922) the following species are recorded from 'Peninsula India Wight Crypt. No. 4; 'Peninsula India' leg. Royle; Madras leg. Fyson 1913; Madras, near Seven Pagodas leg. Kashyan 1922.

¹ This is obviously a mistake for 'Serampur' which is near Calcutta.